VIKRAM SARABHAI SPACE CENTRE

Improved Process Quality for Spacecraft Manufacturing

About the Client

VSSC (Vikram Sarabhai Space Centre), Thiruvananthapuram, Kerala is one of the main space research and development establishments of the Indian Space Research Organisation (ISRO), focusing on rocket and space vehicles for India's satellite programme. The ISRO has successfully deployed Satellites in Polar Orbits, Geosynchronous Orbits, Moon Missions and Mars Mission. The centre is an entirely indigenous facility working on the development of sounding rockets, the Rohini and Menaka launchers, and the ASLV, PSLV, GSLV and GSLV Mk III families of launch vehicles.

Business Challenge

The ISRO has many contracted 'work-centers' throughout India, notably around Bangalore and Chennai. These work centres are government owned organizations who are contracted out the development of the components and sub-assemblies which are critical in the assembly of launch vehicles. These components are manufactured at the 'work-centers' and are quality checked and despatched to the VSSC. Once in VSSC, these components are assembled into 'Assemblies' which are then combined to form the Launch Vehicle. Some of the challenges faced by the client include

- Lack of an integrated system for data sharing and quality monitoring.
- Workers having to manually conduct quality charting.

> *"Post implementing QC automation tool, we have seen that the number of errors in the inspection reports for both PSLV & GSLV structures has reduced drastically (even to nil) since all the reports are through QC automation system. This has helped us to accelerate the clearance procedure for the structures and with no queries to the work centres. I consider this as a great appreciation for the QC automation project. Let me share the same with you and use this opportunity to convey the above points to all of your employees who have worked for QC automation and who have made this a reality."*
>
> ***- Group Director, QCG-MM/MME, VSSC***

InApp is a software services company operating since 2000. As a world-class business solution provider, we are passionate about technology and building transformative business solutions that empower our clients worldwide, ranging from Fortune 500 companies to SMBs. We take pride in being a technology partner for the long haul, delivering exceptional value to customers through innovation and excellence. We offer an integrated portfolio of software services including Application Services, Software Product Engineering, Disruptive Technology Solutions, DevOps, Mobility Solutions, Independent Testing and more.

InApp's Solution

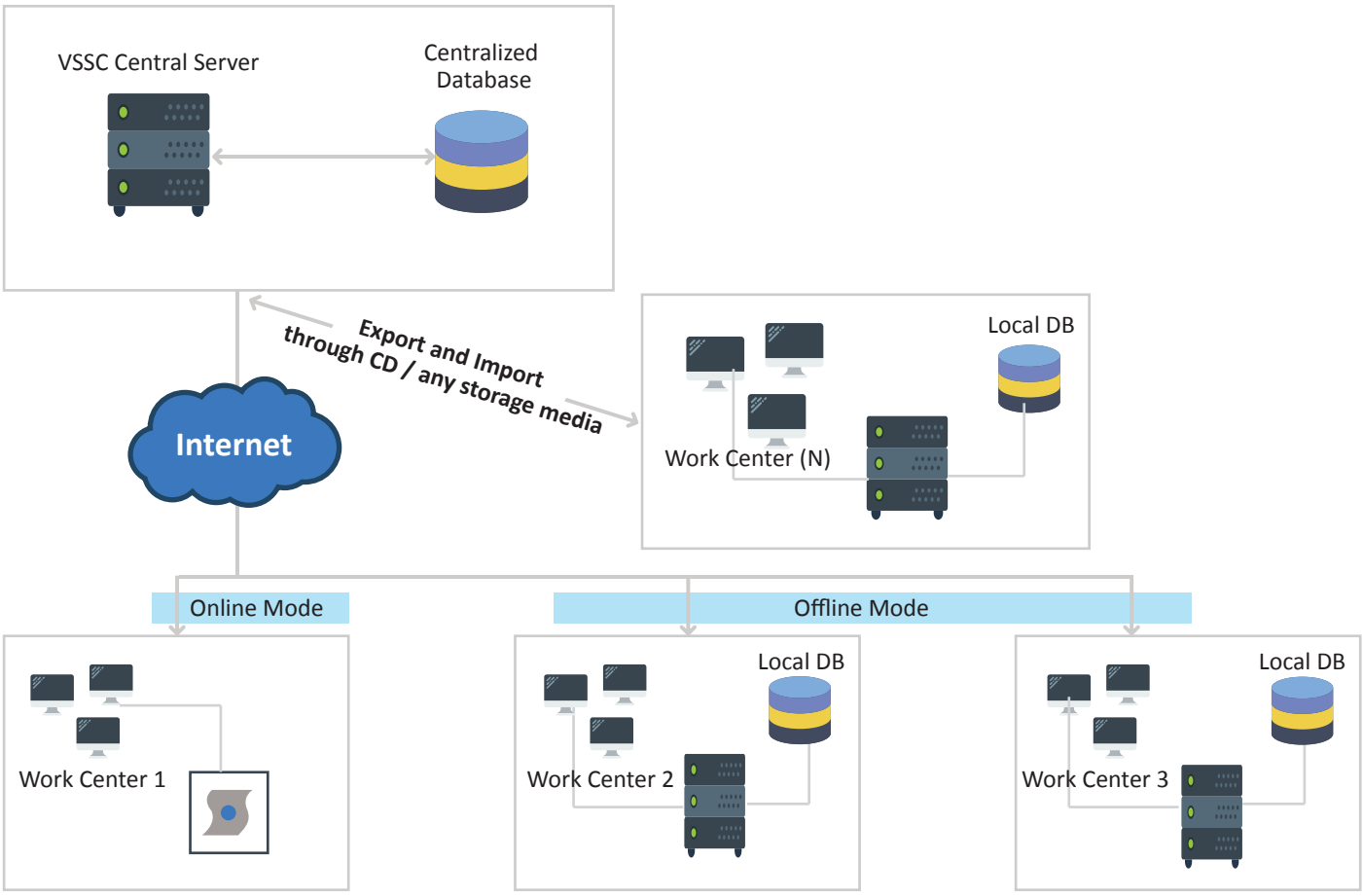
InApp helped develop a QC Automation tool in Java for the quality control documentation, scrutiny and analysis of various hardware components manufactured at the work centres. This dedicated application monitors the quality of individual parts that go into the satellite launch vehicle or the rockets used to boost the satellites and other space vehicles into orbit. It also keeps track of the quality of materials through intervention in the process of production and quality management. This web-based tool stores the exact quality requirement of each component and compares the manufactured product with the detailed specification and reports inconsistencies. The quality reports are processed through a workflow for acceptance/rework/rejection. Close to 200 parameters for several components are monitored using this system.

The process starts with the engineering department designing a component. The details of the component including the (a) dimensions (LxWxH), radius etc. (b) Process Parameters like the Temperature of Smelting, Annealing etc (c) Strength of the component and other parameters are entered into the system. Each component has a master record.

When the components are manufactured at the work centre, the parameters are automatically captured into the system using a web-form. The data is immediately stored in the MySQL database. The data from all work-centres are captured centrally into the VSSC centralized database. The parameters from the specification and from the time of manufacturing are compared. If the parameters are outside the tolerance limit then they are rejected. However, if the deviation is not large, the component may be sent for rework or accepted. The work-flow for accepting or rejecting is also captured to record the details of the certifying officer, the accepting committee names etc. The process is also captured. This helps in tracing the root cause in case of any flight failures.

Business Benefit

- Centralised and integrated solution to ensure the quality of components that go into the assembly of launch vehicles.
- Enhanced tracking mechanism that records every step of the process from the component engineering to deployment.
- Improved restructuring of application that helps in determining the root cause in case of any launch failures.



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